U.S. Department of Transportation
Federal Highway Administration

Priority, Market-Ready Technologies and Innovations

QuickZone

Problem: Work zones contribute to traffic delays

According to a survey released by the Federal Highway Administration (FHWA), travelers view road repairs as a major contributor to traffic delays, and believe that improvements in traffic flow, pavement conditions, and work zones can enhance driver satisfaction significantly. Despite these findings, with the exception of a few high-visibility freeway construction and refurbishment projects, project planners typically do not consider the soft cost of traveler delay when making key decisions about project staging and duration.

The 1998 FHWA report, *Meeting the Customer's Needs for Mobility and Safety During Construction and Maintenance Operations*, highlighted this issue and recommended developing an easy-to-master analytical tool to quickly and flexibly estimate and quantify work zone delays in all four phases of the project development process (policy, planning, design, and operations). The result was a traffic delay estimation tool called QuickZone, which is designed for State and local traffic construction, operations, and construction planning contractors.

Putting It in Perspective

- Work zones account for nearly 24 percent of nonrecurring congestion, which translates to 482 million vehicle hours of delay per year.
- The four main causes of nonrecurring congestion are crashes, weather, work zones, and breakdowns.

Solution: Reducing work zone delays with QuickZone

What is QuickZone?
QuickZone is a traffic impact analysis tool that can be used to estimate work zone delays. For example, QuickZone allows road owners and contractors to compare the effects of doing highway work at night instead of during the day, or of diverting the traffic to different roads at various stages of construction. These effects can be estimated for periods as short as one day or for the entire life of the construction project. QuickZone provides an easy-to-use, easy-to-learn tool that takes advantage of software tools that are familiar to the target user base.

How does QuickZone work?
QuickZone is an open source, Microsoft®-based application suitable for urban and interurban corridor analysis. QuickZone can:

- Quantify corridor delay resulting from capacity decreases in work zones.
- Identify delay impacts of alternative project phasing plans.
- Support tradeoff analyses between construction costs and delay costs.
- Examine the impacts of construction staging by location along mainline, time-of-day (peak vs. off-peak), and season (summer vs. winter).
- Assess travel demand measures and other delay mitigation strategies.
- Help establish work completion incentives.

QuickZone runs on a personal computer, furnishing the information in spreadsheet format. The system prompts users for the data needed to perform the necessary calculations. QuickZone can compare the traffic impacts for work zone mitigation strategies and estimate the costs to motorists in terms of delays and potential backups associated with different strategies or scenarios.

To operate effectively, QuickZone requires:

- Network data—Node data (X-Y coordinates), link data (capacity, length).
- Demand data—Average daily travel, daily and seasonal distributions.

Successful Applications: Decreasing delay in Pennsylvania

In summer 2002, motorists on U.S. Interstate 80 (I-80) in Clarion County, PA experienced significant delays and frustrations caused by traffic backups in highway work zones, and the Pennsylvania Department of Transportation (PENNDOT) received complaints. In response, before beginning a resurfacing project on I-80 in Butler and Clarion Counties, PENNDOT's District 10 turned to QuickZone.

QuickZone helped engineers model different work zone configurations before implementing them on the highway. Applying the software to the I-80 project, PENNDOT engineers were able to select work zone configurations and construction schedules that met project needs while minimizing impacts to the traveling public. Based on the reduced number of complaints and the length of time motorists experienced delays in the work zone, PENNDOT believes the effort was a success. "We are very pleased with the results of QuickZone modeling," said Richard H. Hogg, Professional Engineer, District 10 executive. "Based on what we saw occur on the interstate last year compared to this year, the improvements for our customers, the traveling public, are significant."

Benefits

- Graphic and tabular outputs.
- Low software and hardware operating requirements.
- User-friendly.
- Effective at reducing work zone delays.

Additional Resources

To purchase QuickZone, visit **www-mctrans.ce.ufl.edu** or **www.kutc.ku.edu/pctrans**. The cost is $195.

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